(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 013 314 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
28.06.2000 Bulletin 2000/26

(51) Int Cl.7: A63C 1/02

(21) Application number: 99403236.5

(22) Date of filing: 21.12.1999

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: 22.12.1998 CA 2256917
22.12.1998 CA 2256932
22.12.1998 CA 2256921
19.11.1999 CA 2290209

(71) Applicant: Bauer Nike Hockey Inc.
Montreal, Quebec H4P 2S4 (CA)

(72) Inventors:
- Chênevert, Francois
Blainville (Québec) J7C 4R7 (CA)
- Piedboeuf, Marie-Christine
Pierrefonds (Québec) H9J 3S6 (CA)
- Laroche, Robert
Ile des Soeurs (Québec) H3E 1T3 (CA)

(74) Representative: Burbaud, Eric
Cabinet Plasseraud
84, rue d'Amsterdam
75440 Paris Cédex 09 (FR)

(54) Ice skate runner holder

(57) An ice skate runner holder comprising an elongated frame which has a front pedestal, a rear pedestal and a bridge portion therebetween. The bridge portion joins the front and rear pedestals thereby defining an intermediate opening in the runner holder. The frame also has an interface portion adapted to receive a blade runner; the bridge portion having a hollow tubular configuration which increases the torsional rigidity of the said runner holder. The runner holder may also comprise a resilient reinforcement member extending on the bridge portion to increase the resistance to deflection of the runner holder.

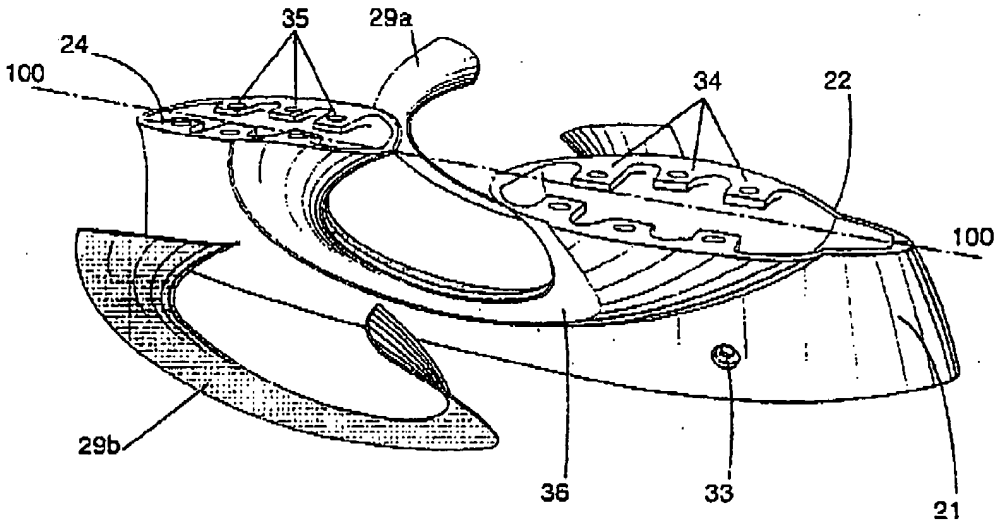

Fig. 8

EP 1 013 314 A1

Description

Field of the invention

[0001] The invention relates to runner holders for ice skates and more particularly, to runner holders suitable for use on ice skates designed for playing hockey and other similar sporting activities.

Background of the Invention

[0002] ice skates are normally fabricated with three main parts: A boot, a ground engaging runner or blade, and a holder connecting the runner to the boot itself. The boot is fairly rigid and adapted to support the foot of the skater. The holder has taken on a wide range of shapes and configurations over the years but is nowadays a plastic frame rigidly attached to the sole of the boot on its upper side. The runner is rigidly affixed to the frame on the lower side thereof. The runner or blade is usually a thin steel strip sharpened on its lower edge and rigidly affixed to the holder on its upper side by vertical fasteners or by horizontal fastener pressing each side of the holder against the upper side of the runner. The assembly of these three parts forms a rigid ice skate, which provides performance and stability to the skater. The interface between the runner and the boot is the holder and as such, it transfers the forces produced by the skater to the runner, which in turn applies it to the ice surface. In a similar fashion, it also transmits shocks and forces from the ice surface back through the runner and onto the skate boot.

[0003] The rigidity of modern ice skates however, provides stability and performance at the expense of a smooth delivery of forces and at the expense of the capacity to absorb impacts from the ice surface. A modern ice skate provides very little resiliency between the ice surface and the skate boot. The forces are transmitted from the runner directly to the boot with little or no resiliency in between. The modern ice skate is stiff and responsive but highly unforgiving when impacts occur and it can be difficult to control during forceful maneuvering by the skater.

[0004] Many attempts have been made over the years to soften the contact between the skate and the ice surface to render the ice skate more absorbing to impacts and generally more comfortable. A wide variety of designs were elaborated in the 19th century, some of which are disclosed in U.S. patents No.47185, No.39149, No. 32833, No.22895, No.31017, No.32821, No.36595, No. 32944, No. 37428, No.236556, No.388693, No.403052, No.429266, and No.618780. These designs provided for a comfortable absorbing ice skate but they lacked responsiveness, stability and overall performance. A most popular design of holder has been the tubular frame. This design provided a light yet rigid structure that was responsive and highly stable. it was, however very rigid and afforded almost no resiliency.

[0005] The TUUK® runner holder was introduced in the late '70 and it provided a more flexible holder than the steel tubular structure it eventually replaced. The TUUK® design, in effect, introduced plastic as the holder material and made use of molding techniques to create a V-shaped front and rear pedestals. This combination provided a runner holder having a smoother transfer of forces between the runner and the boot while maintaining a high level of performance and stability, which represent the best compromise to date. The plastic runner holder has been the class of the field in ice hockey skates since its introduction. However, the plastic holder has its limitation. The flexibility of the structure being nearly equal in all direction, the transfer of forces through the holder is somewhat random. Forces are transferred through the holder in every direction, which is less than ideal.

[0006] Various approaches were made based on the TUUK® design to find a better compromise but these have achieved mitigated success. None of these prior designs has been able to provide an ice skate that affords a degree of resiliency between the skate boot and the runner without sacrificing performance and stability. Considering the popularity of ice skating and hockey in particular, there is a demand for an improved ice skate runner holder capable of meeting these criteria.

Objects and statement of the invention

[0007] It is thus an object of the invention to provide a runner holder for ice skate adapted to provide a level of resiliency while improving the performance of the ice skate.

[0008] It is another object of the invention to provide a runner holder for ice skate that controls the level of resiliency of the ice skate.

[0009] It is another object of the invention to provide a runner holder for ice skate that is easy to manufacture and assemble.

[0010] It is a further object of the invention to provide a runner holder that is lightweight.

[0011] As embodied and broadly described herein, the invention provides an ice skate runner holder comprising an elongated frame which has a front pedestal, a rear pedestal and a bridge portion therebetween. The bridge portion joins the front and rear pedestals thereby defining an intermediate opening in the runner holder. The frame also has an interface portion adapted to receive a runner and a resilient reinforcement member extending on the bridge portion to control the resistance to deflection of the runner holder at the bridge portion.

[0012] Advantageously, the runner holder further comprises a resilient reinforcement member on both sides of the bridge portion. Furthermore, the modulus of elasticity of the resilient reinforcement member is higher than that of the frame. The frame includes two longitudinal segments that are assembled together along the central longitudinal plane of the frame thereby creating

a hollow tubular bridge portion, which increases the torsional rigidity of the runner holder. The resilient reinforcement members may be laminated or glued onto the bridge portion of the runner holder.

[0013] Preferably, the frame further comprises a recessed portion on each sides of the frame, having the general shape and configuration of a corresponding resilient reinforcement member and adapted to receive a corresponding resilient reinforcement member. In a particular embodiment, the outer surface of the reinforcement member is flush with the adjacent portions of the frame.

[0014] The runner holder is essentially made of a thin walled plastic elongated frame having a low modulus of elasticity, combined with a pair of thin reinforcement members having a different modulus of elasticity. The variation of material of reinforcement members allows a variation of the resiliency of the runner holder. The runner holder is rigidly mounted to the skate boot and the runner is also rigidly attached to the runner holder.

[0015] As embodied and broadly described herein, the invention provides an ice skate runner holder comprising an elongated frame having a front pedestal, a rear pedestal and a bridge portion therebetween. The bridge portion joins the front and rear pedestals thereby defining an intermediate opening in the runner holder. The frame also has an interface portion adapted to receive a runner. The bridge portion has a hollow tubular configuration, which increases the torsional rigidity of the runner holder. The frame further includes two longitudinal segments that are assembled together along the central longitudinal plane of the frame. The two longitudinal segments may be glued, welded or fused together. The runner holder so constructed may further comprise a resilient reinforcement member extending on the bridge portion to control the resistance to deflection of the runner holder in the area of the bridge portion.

[0016] As embodied and broadly described herein, the invention also provides an ice skate comprising a boot having lateral and medial quarter portions, a toe cap, a tongue, a tendon guard, an insole and an outsole and a runner holder mounted to the outsole. The runner holder comprises an elongated frame which has a front pedestal, a rear pedestal and a bridge portion therebetween. The bridge portion joins the front and rear pedestals thereby defining an intermediate opening in the runner holder. The frame also has an interface portion adapted to receive a runner. The bridge portion has a hollow tubular configuration, which increases the torsional rigidity of the runner holder. Advantageously, the frame includes two longitudinal segments that are assembled together along the central longitudinal plane of the frame and a resilient reinforcement member extending is provided on the bridge portion to control the resistance to deflection of the runner holder at the bridge portion.

[0017] Other objects and features of the invention will become apparent by reference to the following description and the drawings.

Brief description of the drawings

[0018] A detailed description of the preferred embodiments of the present invention is provided herein below, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a side elevational view of a runner holder according to the invention mounted to a typical skate boot;

Figure 2 is a perspective view of a runner holder according to the invention prior to installation on a skate boot;

Figure 3 is a side elevational view of the runner holder of Figure 2 according to the invention;

Figure 3A is a sectional view of the runner holder of Figure 3 taken at line 3A-3A;

Figure 3B is a sectional view of the runner holder of Figure 3 taken at line 3B-3B;

Figure 3C is a sectional view of the runner holder of Figure 3 taken at line 3C-3C;

Figure 3D is a sectional view of the runner holder of Figure 3 taken at line 3D-3D;

Figure 3E is a sectional view of the runner holder of Figure 3 taken at line 3E-3E;

Figure 4 is a side elevational view of a reinforcement member of the runner holder of figure 3 according to the invention;

Figure 5 is a top plan view of the reinforcement members with the runner holder shown in dotted lines.

Figure 6 is a side sectional view of the runner holder of Figure 2 illustrating the anchoring of a runner to the runner holder according to the invention;

Figure 7 is a side elevational view of a runner holder according to the invention mounted to a typical skate boot with the deflection of the runner holder shown in stippled lines.

Figure 8 is an exploded perspective view of a runner holder according the invention;

Figure 9 is an exploded top plan view of a runner holder according to the invention;

Figure 10 is an exploded top plan view of a runner holder according to a second embodiment of the invention;

Figure 11 is an exploded perspective view of a runner holder according to a third embodiment of the invention;

Figure 12 is a perspective view of a runner holder according to a fourth embodiment of the invention;

Figure 13 is a side elevational view of a runner holder according to a fifth embodiment of the invention mounted to a typical skate boot;

[0019] In the drawings, preferred embodiments of the invention are illustrated by way of examples. It is to be expressly understood that the description and drawings are only for the purpose of illustration and are an aid for understanding. They are not intended to be a definition of the limits of the invention.

Detailed description of preferred embodiments

[0020] Figure 1 illustrates an ice skate 19 having a typical skate boot 18 to which is secured a runner holder 20 in accordance with the invention. Skate boot 18 traditionally features a toe portion 60 at the front of boot 18 to enclose the skater's toes, a heel portion 61 at the rear of boot 18, to support the heel of the skater, side walls 68 on each side of boot 18 to laterally support the foot and an outsole 62 extending from the heel portion 61 to the toe portion 60 and affixed, usually with glue or fasteners, to the bottom of boot 18. The outsole 62 is made of a rigid plastic and serves as an anchoring platform for the runner holder 20. The upper portion of boot 18 comprises an ankle portion 63, enclosing and supporting the ankle of the skater, and a tendon guard 64 extending upwardly from ankle portion 63 to add support to the ankle and protection to the Achilles tendon of the skater. A tongue 65 is attached to the inner side of toe portion 60 and covers the entire frontal area of the foot, the frontal area of the ankle and lower front portion of the leg. An opening is defined between each side wall 68 and tongue 65 for insertion and removal of the foot. Laces are traditionally attached to lacing apertures 66, which extend along the edge of each side wall 68 and enable the wearer to firmly enclose his foot to boot 18.

[0021] The runner holder 20 is formed of an elongated plastic molded frame 21 having a front pedestal 22 underneath toe portion 60 of skate boot 18, a rear pedestal 24 underneath heel portion 61 of skate boot 18 and a bridge portion 26 connecting front and rear pedestals 22 and 24 of the runner holder 20. Bridge portion 26 thereby defines an opening 25 in the central area of runner holder 20. Runner holder 20 is rigidly attached to skate boot 18 by fastening front and rear pedestals 22 and 24 to the outsole 62 of skate boot 18 with rivets or screws.

[0022] The lower portion of elongated frame 21 is provided with a receptacle longitudinal slot 28 best seen in Figure 3A,3B,3C,3D and 3E and adapted to receive a runner 30. Runner 30 is a narrow steel strip extending along the length of runner holder 20. It is sharpened on its ice contacting surface 75 and provided with anchoring means on its upper side 76. It has a curved profile, which is accentuated near its extremities 70 and 71. Runner 30 is inserted into longitudinal slot 28 and secured to frame 21 with a rear peg 31, which hooks on to a protuberance 74 inside longitudinal slot 28 and a front fastener 32 (shown in Figure 1), which locks aperture 78 to frame 21. Runner 30 may also be attached to elongated frame 21 in any well known manner such as with threaded fasteners having a first end engaging apertures of runner 30 and a second end extending upwardly from runner 30 and engaging elongated frame 21 with nuts.

[0023] Referring back to Figure 1, resilient reinforcement members 29 are disposed on each sides of bridge portion 26 between front and rear pedestals 22 and 24 thereby surrounding opening 25 of runner holder 20. Resilient reinforcement members 29 are made of a material having a higher modulus of elasticity than that of frame 21. Frame 21 is preferably made of a plastic material while reinforcement members 29 are preferably made of a composite of fiber and resin. Reinforcement members 29 are preferably made of, but not limited to, a composite of fibers and nylon or fibers and epoxy resin. The fibers are preferably carbon, glass or aramide fibers for their high modulus of elasticity.

[0024] Figure 2 illustrates runner holder 20 prior to installation onto skate boot 18. Front and rear pedestals 22 and 24 are of hollow construction for weight reduction and for molding requirement as most plastic runner holder are. A plurality of anchoring projections 34 extend from walls 37 of front and rear pedestals 22 and 24. Each anchoring projection 34 features an aperture 35 provided to fasten runner holder 20 to outsole 62 of skate boot 18 with rivets or screws. Frame 21 is provided with an aperture 33 to insert front fastener 32, which locks runner 30 to frame 21.

[0025] Referring to Figure 3, reinforcement member 29 in this side elevation may be viewed as a lying C-shape member which acts as reinforcement to the plastic molded frame 21 but also as a spring working along the vertical axis 101. As shown in Figure 4, C-shape reinforcement member 29 is compressed when forces F are applied along vertical axis 101. The C-shape reinforcement member 29 flexes around apex 45 and 46 much like a spring, and as such, reinforcement member 29 will regain its original position when forces F are removed. Reinforcement members 29 when mounted to each sides of runner holder 20, thereby provide a resiliency rate to ice skate 19, which is directed along the general direction of vertical axis 101.

[0026] Figure 3A to 3E illustrate the profile of runner

holder 20 taken at line 3A-3A, 3B-3B, 3C-3C, 3D-3D, 3E-3E respectively of figure 3. Figure 3A illustrates a section of rear pedestal 24 where there is no reinforcement. As previously mentioned, rear pedestal 24 is hollow and provided with anchoring projections 34, each having apertures 35 to enable fastening of runner holder 20 to skate boot 18. Note receptacle longitudinal slot 28 in the lower portion of frame 21. Figure 3B taken at line 3B-3B, clearly shows reinforcement members 29a and 29b on each side of frame 21. It can be seen that each side of frame 21 is strengthened by the higher modulus of each reinforcement member.

[0027] Figure 3C illustrates a section of bridge portion 26. Bridge portion 26 is preferably hollow with reinforcement members 29a and 29b mounted in the top portion. The bridge portion of a prior art runner holder is usually hollowed out from the outside for weight reduction. Bridge portion 26 is hollowed from the inside for weight reduction, thereby creating a tubular structure extending from front pedestal 22 to rear pedestal 24. The tubular structure of bridge portion 26 increases the overall torsional rigidity of the elongated frame 21. Figure 3D illustrates a section of front pedestal 22 having reinforcement members 29a and 29b mounted on each side for added rigidity. Figure 3E illustrates a section of front pedestal 22 where there is no reinforcement.

[0028] Referring now to Figure 5, which is a top plan view of reinforcement members 29 showing frame 21 in dotted line; it can be seen that two reinforcement members 29a and 29b are paired, one on each side of frame 21. Reinforcement members 29a and 29b act as stiffening members along the vertical axis 101 as best shown in Figure 4 and 7. Reinforcement members 29 marginally increase the rigidity of runner holder 20 along longitudinal axis 100, while providing a spring action and controlled level of resiliency along the vertical axis 101. The vertical axis 101 being the privileged path for transmitting forces from the foot to runner 30, runner holder 20 with reinforcement members 29 mounted to each side, enables a controlled resiliency between boot 18 and runner 30 in the direction of axis 101. This in turn provides a smooth transmission of forces and absorbing means to the ice skate 19.

[0029] Along longitudinal axis 100, the tubular structure of bridge portion 26 increases the longitudinal rigidity of frame 21 and prevents torsion of bridge portion 26 and twisting motion between front and rear pedestals 22 and 24. This provides the required rigidity along longitudinal axis 100 to ensure stability and high performance for the ice skate 19.

[0030] The tubular structure of bridge portion 26 combined with reinforcement members 29 creates a runner holder 20 having smooth delivery of forces to the ice surface, impact absorption means and high longitudinal rigidity.

[0031] Referring to Figure 7, Reinforcement members 29 are positioned directly above bridge portion 26. Their specific C-shape and their material characteristics provide a controlled spring rate to runner holder 20 along a vertical plane defined by vertical axis 101 and longitudinal axis 100. The apex 45 and 46 of reinforcement members 29 in the areas adjacent front and rear pedestals 22 and 24 provide added support to frame 21 when pressure is applied to the skate. As shown in Figure 7, under a pressure force, apex 45 and 46 yield partially and both C-shape reinforcement members 29 are compressed with frame 21 as shown with stippled lines. In the compressed state, reinforcement members 29 store energy, which is released when pressure force 50 is removed. Runner holder 20 bends slightly under the pressure force and bridge portion 26 tends to shrink opening 25. The added strength of reinforcement members 29 minimizes the deflection of runner holder 20 but also stores the energy required to produce the deflection and releases it back to the skater once the pressure on the skate is reduced. As a normal spring, reinforcement members 29 provide added support and energy storing and releasing property to runner holder 20.

[0032] It must be noted that the location and orientation of reinforcement members 29 on each side of bridge portion 26 coincides with the direction in which the energy is transferred which is in line with plane 100-101. The location and orientation of reinforcement members 29 is such as to control the energy transfer between skate boot 18 and runner 30.

[0033] For example, when a skater accelerates, a pressure 50 is applied to the runner holder 20 at the beginning of the power stroke, which is strong enough to deflect runner holder 20 as depicted in Figure 7 by the stippled lines. Energy is stored into reinforcement members 29 during the first stage of the power stroke when each member 29 is compressed. As the power stroke ends, the weight of the skater shifts to the other leg, and the pressure applied to runner holder 20 decreases proportionally. The energy stored in each reinforcement member 29 is released back to the skater as runner holder 20 returns to its original position and in the process, gives a extra boost to the end of the power stroke. Runner holder 20 provides an energy distribution during the power stroke that is advantageous to the skater. In a turning maneuver, pressure is applied to runner holder 20 in the same manner. A deflection of runner holder 20 occurs which partially absorbs or stores the energy of the turn providing a smooth transfer of forces between boot 18 and the ice surface.

[0034] The resiliency rate of runner holder 20 and the threshold point at which runner holder 20 begins its deflection are a function of the reinforcement members' materials characteristics, their thickness and their specific shape. The C-shape of reinforcement members 29 enables a controlled deflection by bending in the area of apex 45 and 46 adjacent front and rear pedestals 22 and 24. The thickness of reinforcement members 29 combined with the characteristics of the materials used, define the stiffness of reinforcement members 29. The particular shape of reinforcement members 29, the ma-

terial used and its thickness altogether define the resiliency constant of reinforcement members 29.

[0035] It must be noted that for light skaters, runner holder 20 may be installed on skate 19 without reinforcement members 29. Frame 21 has an inherent resiliency rate along vertical axis 101, which is sufficient for light skaters. Frame 21 alone embodies the minimal resiliency rate of runner holder 20.

[0036] Figures 8 and 9 specifically, illustrate that runner holder 20 is made of the combination of elongated frame 21 and a pair of resilient reinforcement members 29a and 29b positioned on both sides of frame 21. Figure 8 shows that elongated frame 21 is designed with recessed portions 36 on each sides having substantially the same general shape and configuration as that of the corresponding resilient reinforcement member 29a or 29b. Recessed portions 36 are adapted to receive and position each resilient member 29 in their proper location. It must be noted that the shape and configuration of inner resilient reinforcement member 29a and outer resilient reinforcement member 29b differs marginally to account for the fact that the central longitudinal axis of a typical skate which is defined by runner 30 is slightly offset towards the inner side of skate 19. Because of this marginal difference, inner and outer resilient reinforcement members 29a and 29b are not interchangeable and it also implies that, for the other skate, a mirror image of each resilient member 29a and 29b must be made. Therefore, inner and outer resilient reinforcement members 29a and 29b will have to be produced for left skates and right skates.

[0037] Recessed portion 36 could be designed specifically to insure that a single inner resilient reinforcement member 29a can be interchangeable between left and right skates and similarly outer resilient reinforcement member 29b could be interchangeable if the outer recessed portion 36 of the left and right skate were identical. This feature would save tooling and production cost. In the same line of thought, left and right runner holder could be centered with the boot as opposed to slightly offset toward the inside and thereby interchangeable between left and right skate in order to further reduce tooling cost. However each of these steps to save cost also tend to reduce the performance of the final product.

[0038] Each resilient reinforcement member 29 is either glued into its corresponding recessed portion 36, laminated or pre-molded into elongated frame 21 in their pre-determined position. Pre-molding of reinforcement members 29 consists essentially of positioning reinforcement members 29 into the mold of frame 21 and then injecting the mold with the appropriate plastic. Once the plastic has hardened, reinforcement members 29 are affixed to frame 21.

[0039] Figure 10 illustrates that elongated frame 21 is preferably made up of two longitudinal segments 40 and 41 that are glued, welded or fused together along the central axis of frame 21. This method of fabricating runner holder 21 enables the formation of the a hollowed bridge portion as shown in Figure 3C which creates the tubular structure responsible for the increase torsional rigidity of the runner holder 20 This method of fabricating runner holder 21 also entails that resilient reinforcement members 29a and 29b may be laminated or pre-molded to their corresponding segments 40 or 41 prior to their assembly. Fabricating elongated frame 21 in two longitudinal segments 40 and 41 has the advantage of a better control of the thickness the walls of elongated frame 21 during the injection molding of each segment 40 or 41. Typical plastic runner holder walls often have wide variations of thickness due to the complexity of the single mold. These variations are avoided by the use of two simpler molds.

[0040] Advantageously, the combination of a softer and therefore thinner walled elongated frame 21 and extremely light yet rigid resilient reinforcement members 29 also provides for an overall lighter runner holder 20.

[0041] As an alternative to the previous embodiment, resilient reinforcement members 29 can be affixed temporarily and replaced if need be. A skater is thereby able to try a variety of reinforcement members 29 having different spring constant and decide which reinforcement member 29 best suite his skating style. In this alternative, reinforcement members 29 are affixed to frame 21 with weaker glue or with fasteners 47 as illustrated in Figure 11. Reinforcement members 29 may also be temporarily affixed to frame 21 by anchoring means 48 as depicted in Figure 12.

[0042] In yet another variation of the present invention, rear pedestal 24 may be adapted to extend above outsole 62 thereby marginally increasing the overall length of reinforcement members 29 while also providing added lateral support and rigidity to the rear pedestal 24. The shape of rear pedestal 24 also marginally increases the surface of contact between runner holder 20 and skate boot 18.

[0043] The above description of preferred embodiments should not be interpreted in a limiting manner since other variations, modifications and refinements are possible within the spirit and scope of the present invention. The scope of the invention is defined in the appended claims and their equivalents.

Claims

1. A ice skate runner holder (20) comprising an elongated frame (21) which has a front pedestal (22), a rear pedestal (24) and a bridge portion (26) therebetween, said bridge portion (26) joining said front and rear pedestals (22, 24) thereby defining an intermediate opening (25) in said runner holder (20), said frame (21) also having an interface portion (28) adapted to receive a runner (30); said runner holder (20) also comprising a resilient reinforcement member (29) extending on said bridge portion (26) to

control the resistance to deflection of said runner holder (20) at said bridge portion (26).

2. An ice skate runner holder (20) as defined in claim 1 further comprising a resilient reinforcement member (29a, 29b) on both sides of said bridge portion (26).

3. An ice skate runner holder (20) as defined in claims 1 or 2 wherein the modulus of elasticity of said resilient reinforcement member (29a, 29b) is higher than that of said frame (21).

4. An ice skate runner holder (20) as defined in any one of the preceding claims wherein said resilient reinforcement members (29a, 29b) are affixed onto said bridge portion (26).

5. An ice skate runner holder as defined in any one of claims 2 to 4 wherein said frame (21) further comprises a recessed portion (36) on each sides of said frame (21), each said recessed portion (36) having the general shape and configuration of a corresponding resilient reinforcement member (29) and adapted to receive said corresponding resilient reinforcement member (29).

6. An ice skate runner holder (20) as defined in claim 5 wherein said resilient reinforcement member (29) is affixed onto said recessed portion (36).

7. An ice skate runner holder (20) as defined in any one of the preceding claims wherein resilient reinforcement member (20) is molded together with said frame (21).

8. An ice skate runner holder (20) as defined in any one of the preceding claims wherein said frame (21) includes two longitudinal segments (40, 41) that are assembled together along the central longitudinal plane of said frame (21).

9. An ice skate runner holder (20) as defined in claim 8 wherein a resilient reinforcement member (29) is laminated to each said longitudinal segments (40, 41) prior to assembly of said two longitudinal segments (40, 41).

10. An ice skate runner holder (20) as defined in any one of the preceding claims wherein said bridge portion (26) is hollow which provides increased torsional rigidity.

11. An ice skate runner holder (20) as defined in any one of the preceding claims wherein said resilient reinforcement member (29) is C-shaped.

12. An ice skate (19) comprising:

- a boot (18) having lateral and medial quarter portions (68), a toe cap (60), a tongue (65), a tendon guard (64), an insole and an outsole (62); and
- a runner holder (20) as defined in any one of the preceding claims mounted to said outsole (62).

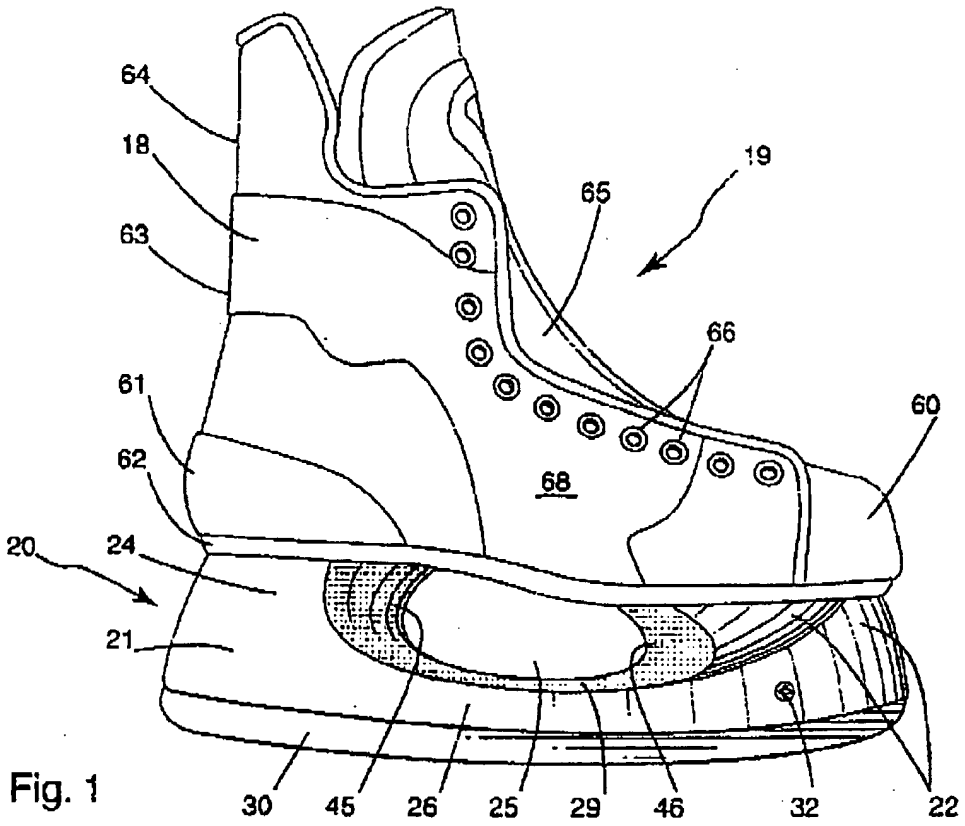

Fig. 1

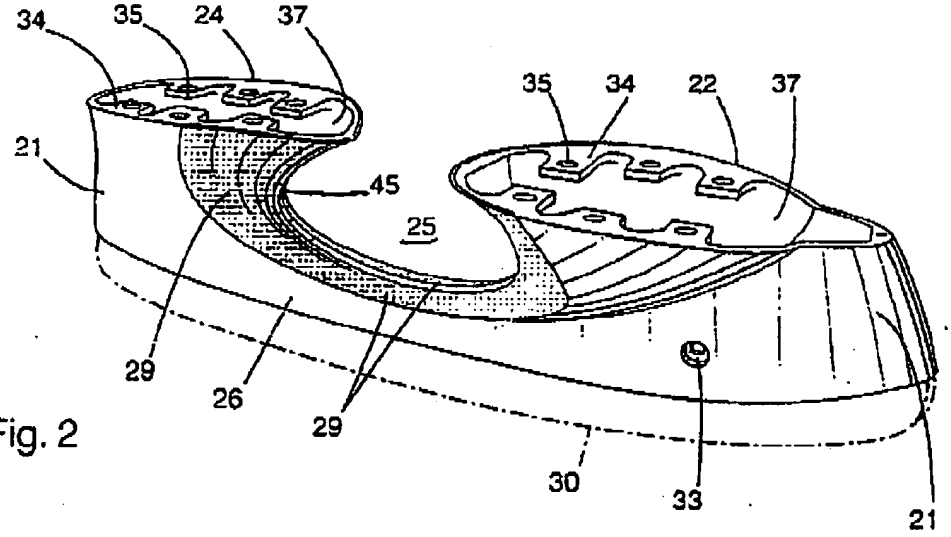

Fig. 2

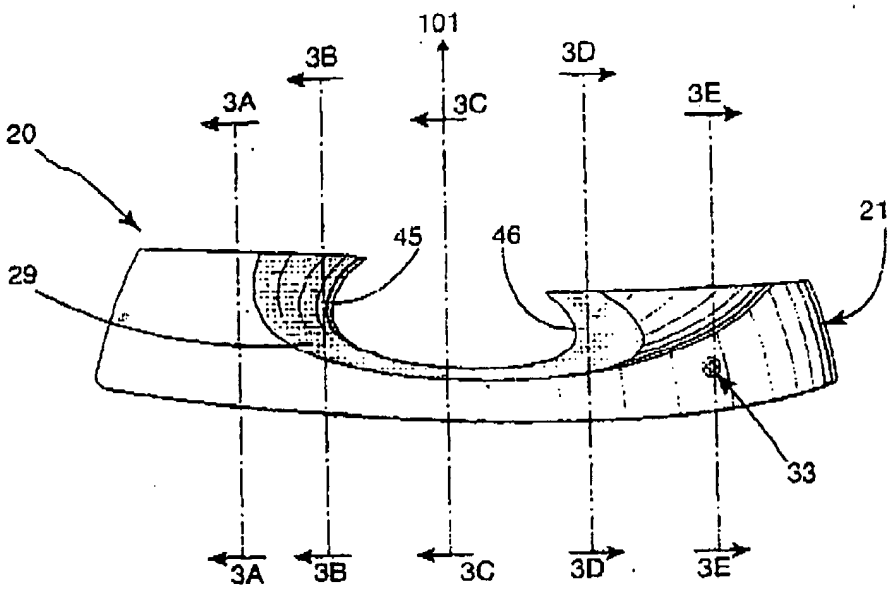

Fig. 3

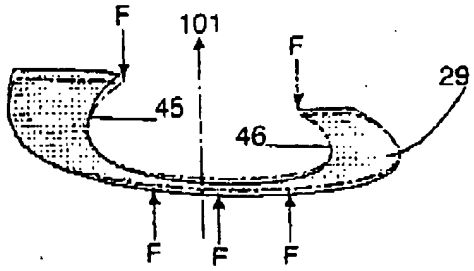

Fig. 4

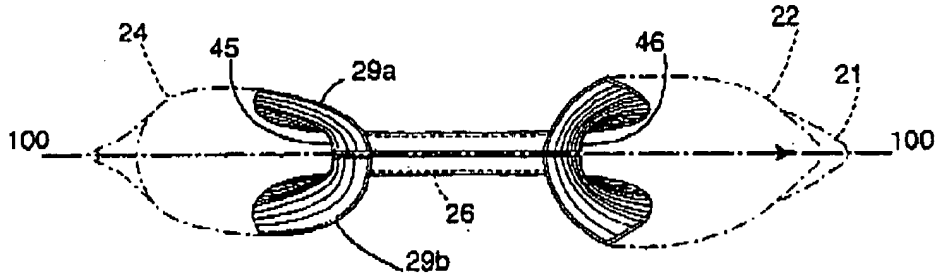

Fig. 5

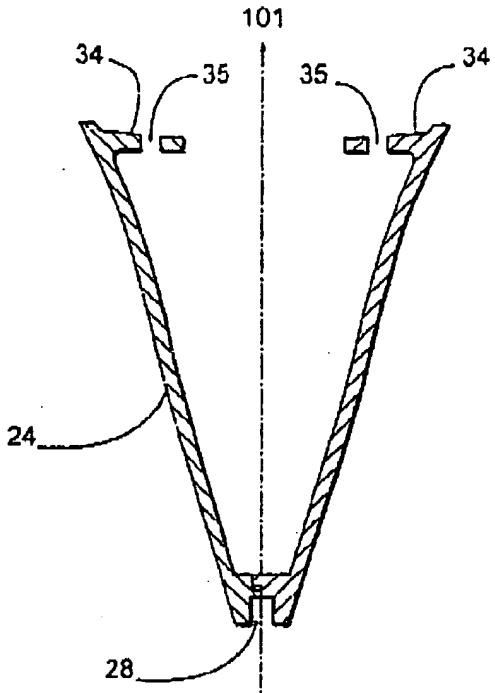

Fig. 3A

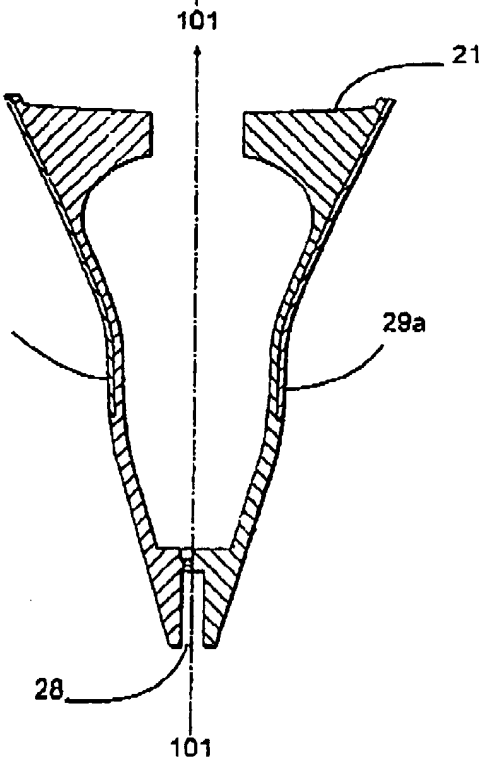

Fig. 3B

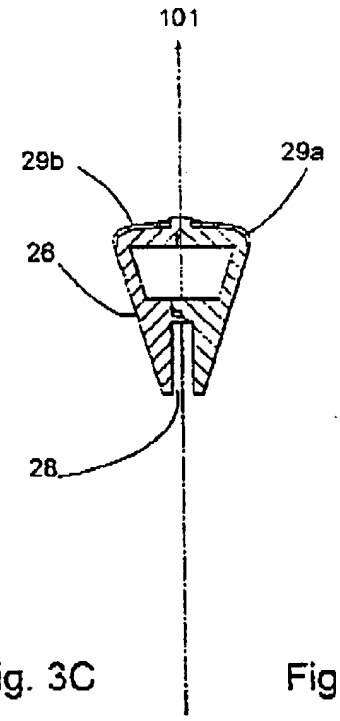

Fig. 3C

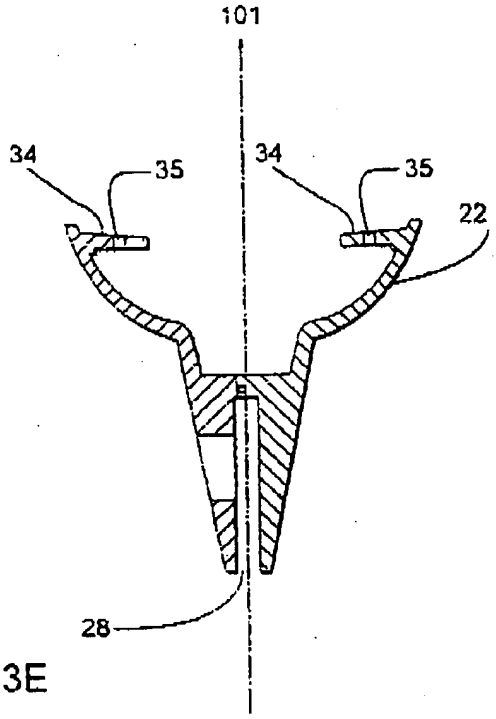

Fig. 3E

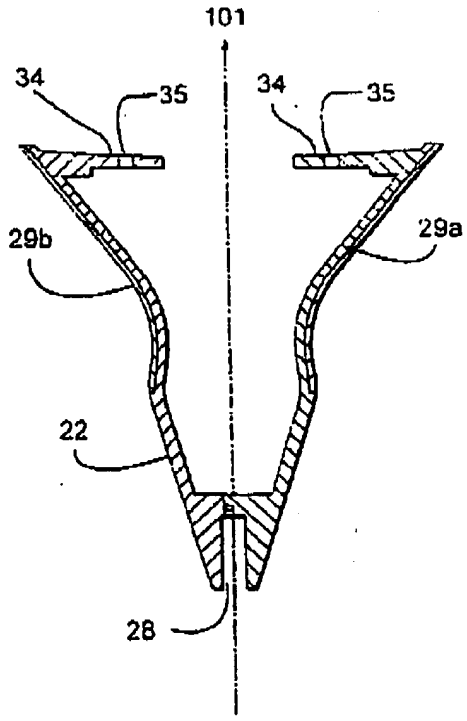

Fig. 3D

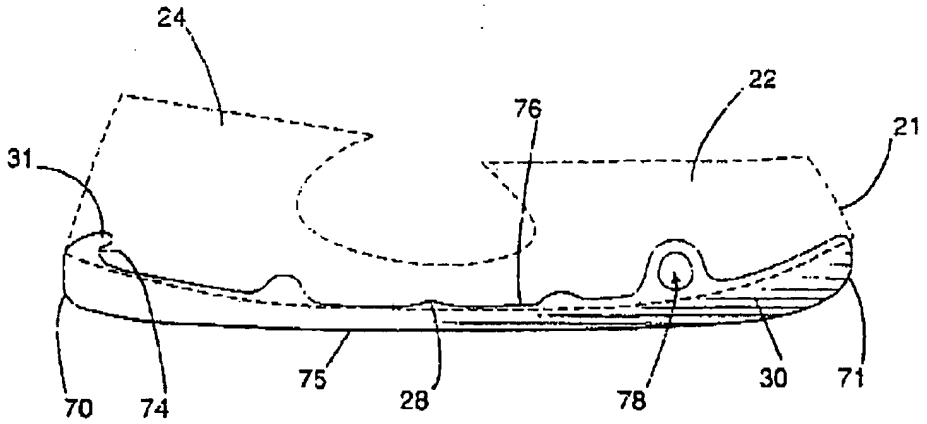

Fig. 6

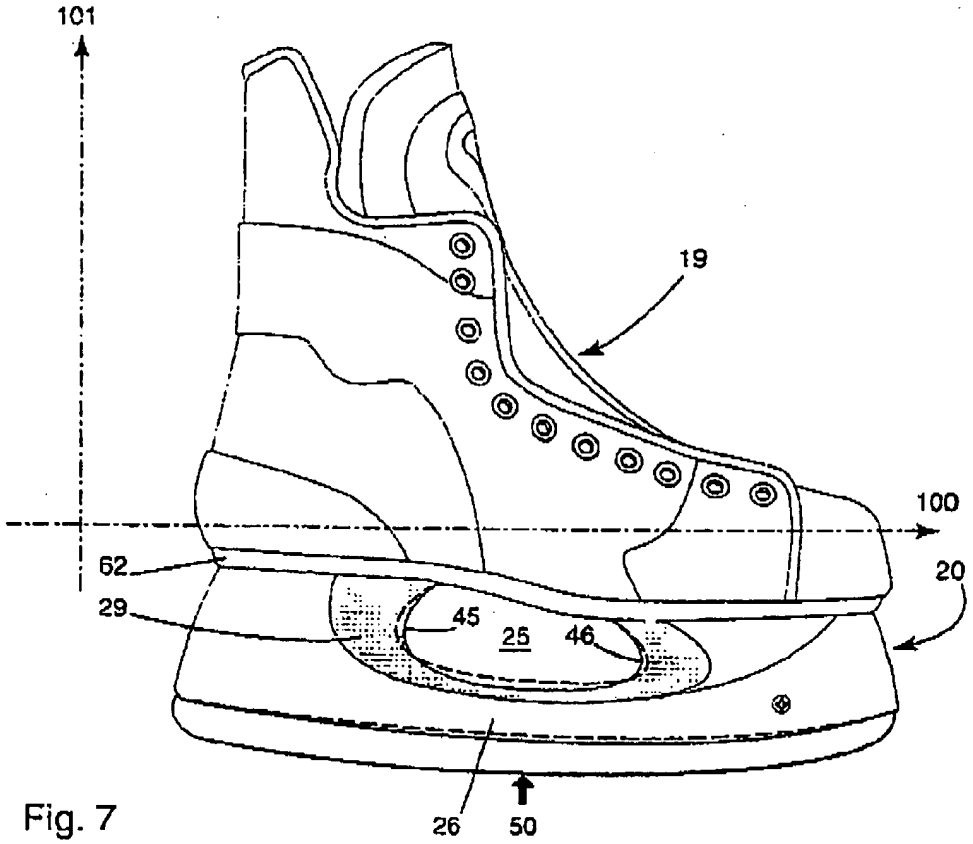

Fig. 7

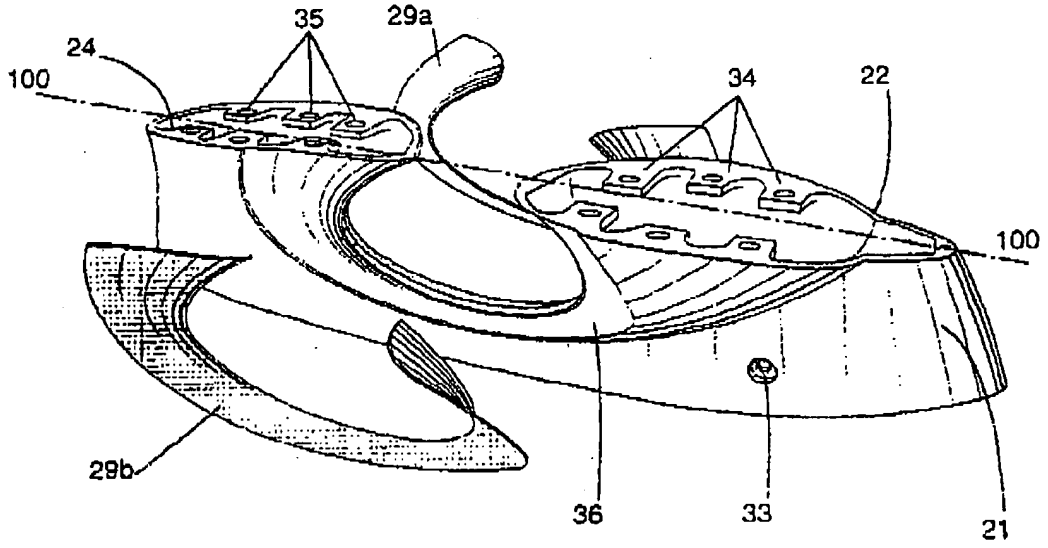

Fig. 8

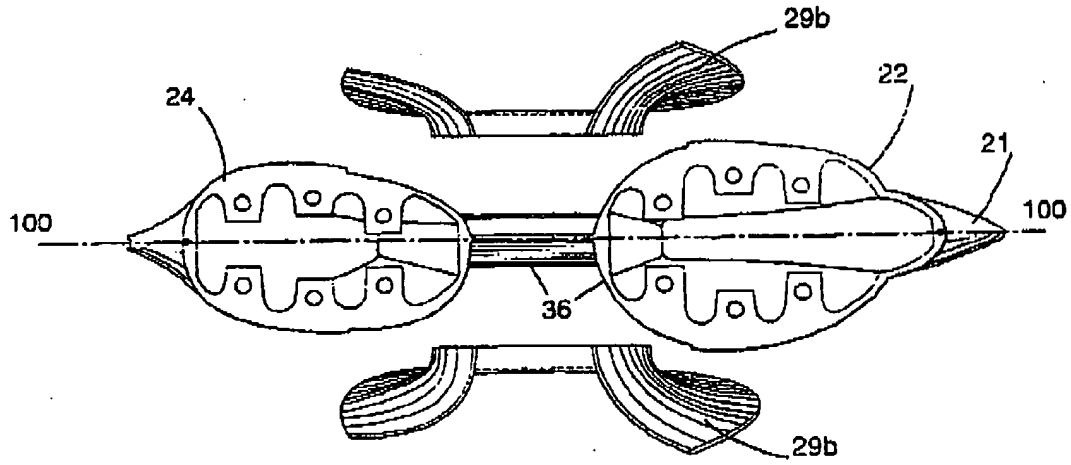

Fig. 9

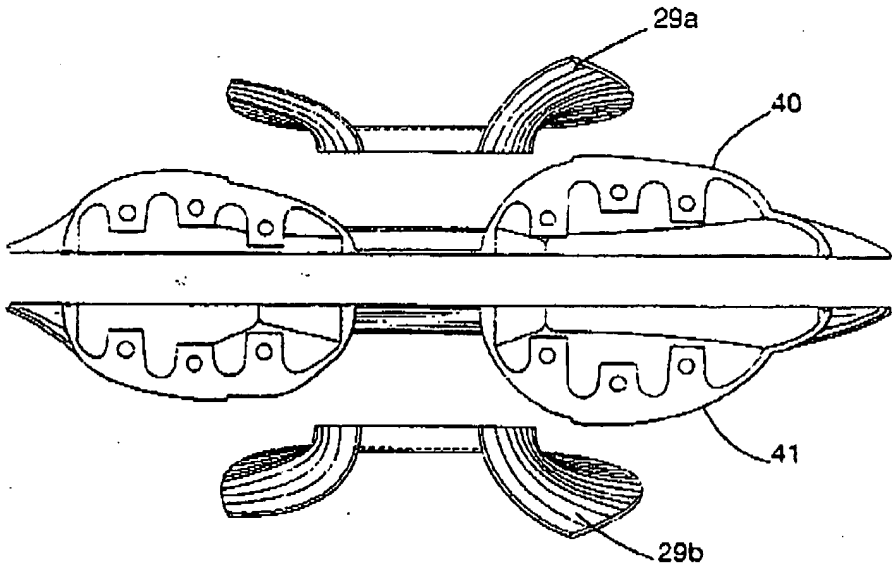

Fig. 10

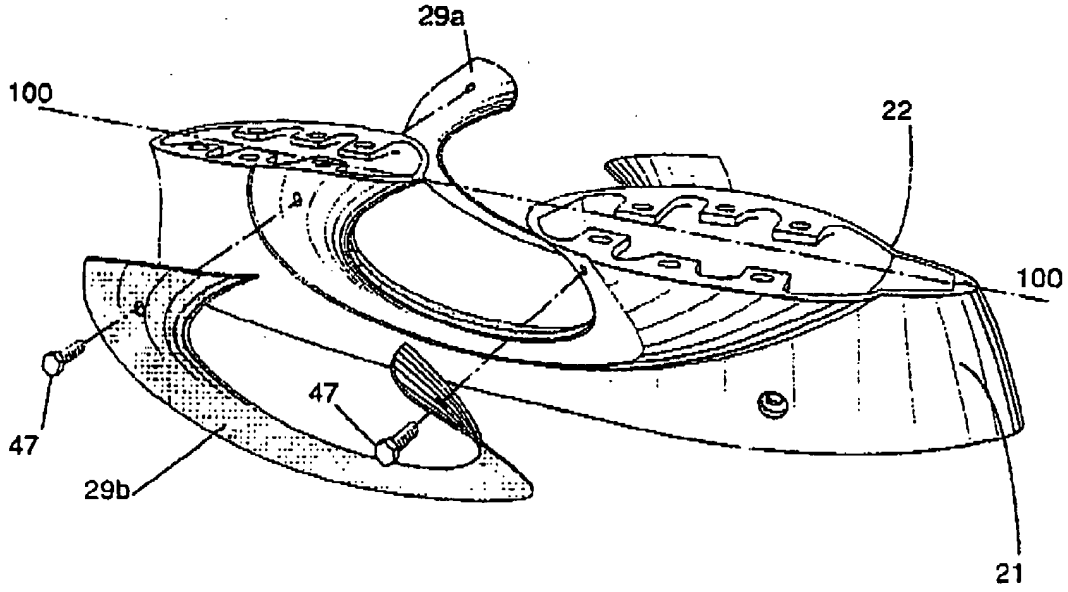

Fig.11

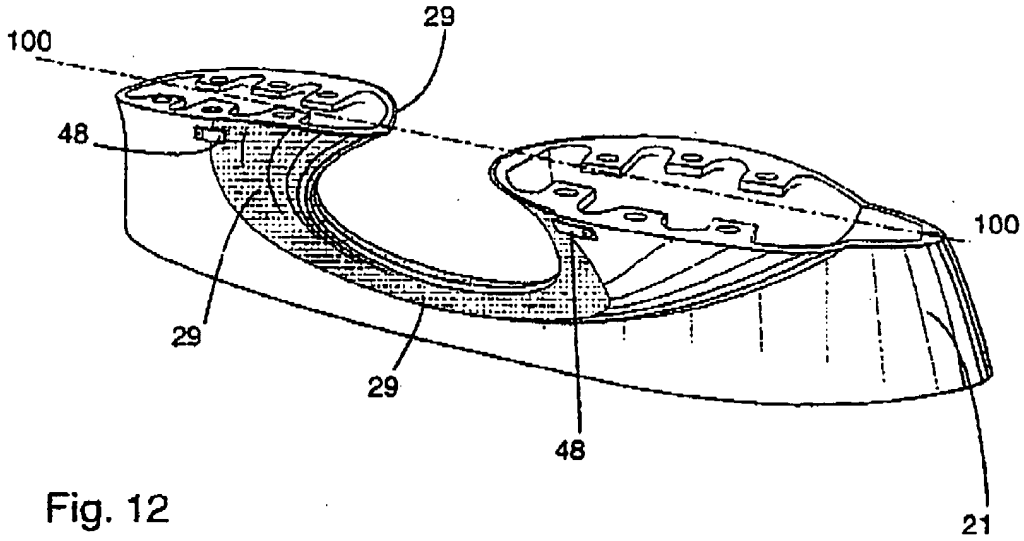

Fig. 12

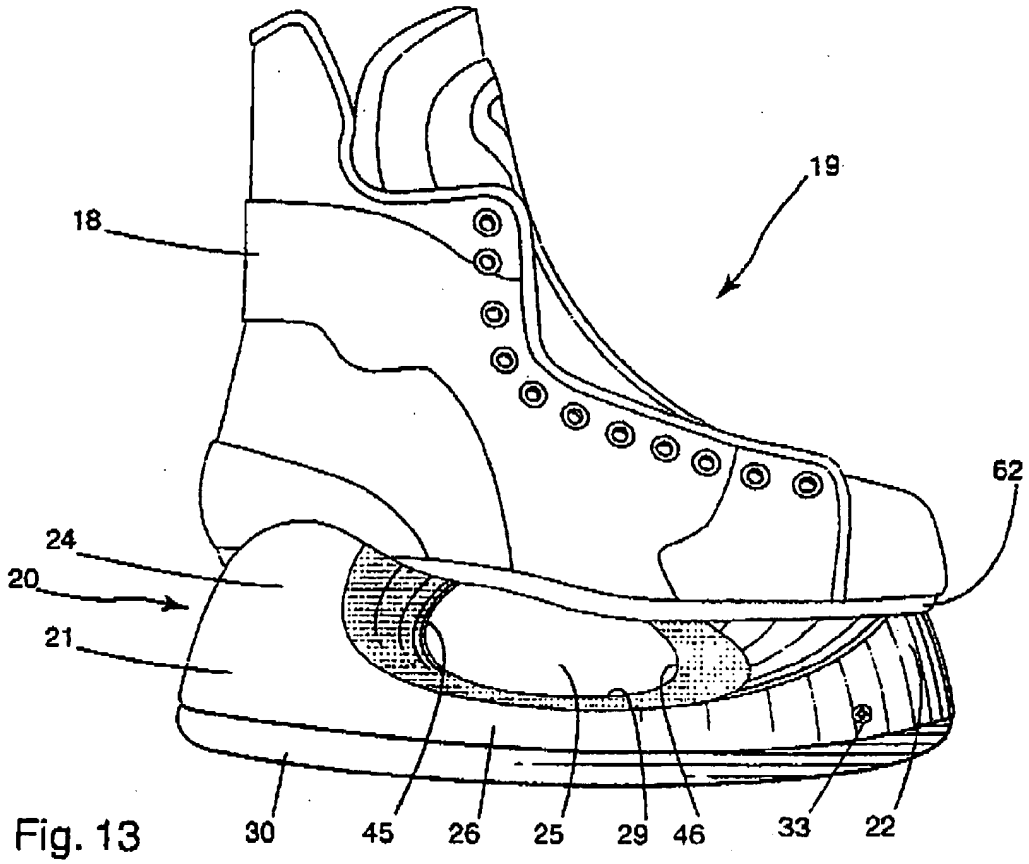

Fig. 13

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 40 3236

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	EP 0 867 207 A (BAUER ITALIA S.P.A.) 30 September 1998 (1998-09-30) * column 2, paragraph 5 - paragraph 7; figures 1,9,10 *	1-3,8	A63C1/02
A	WO 95 34352 A (CANSTAR SPORTS INC.) 21 December 1995 (1995-12-21) * page 4, paragraph 4; figures 1,2 *	1,12	
A	WO 97 33665 A (SALOMON SA) 18 September 1997 (1997-09-18) * figures 1-3,10 *	1,2,12	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7) A63C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	29 March 2000	Steegman, R

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 99 40 3236

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

29-03-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 867207 A	30-09-1998	IT PD970045 A	10-09-1998
		CA 2231285 A	10-09-1998
		JP 11009756 A	19-01-1999
WO 9534352 A	21-12-1995	US 5484148 A	16-01-1996
		CA 2199391 A	21-12-1995
		DE 69509652 D	17-06-1999
		DE 69509652 T	21-10-1999
		EP 0765181 A	02-04-1997
WO 9733665 A	18-09-1997	FR 2746024 A	19-09-1997
		EP 0886539 A	30-12-1998
		EP 0886540 A	30-12-1998
		WO 9733666 A	18-09-1997

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82